

CLAIMS

Sub 1
1. Method for in-situ modernization of a heterogeneous synthesis reactor, including an external shell comprising at least a catalytic bed (6) of the radial or axial-radial type, provided with opposite perforated cylindrical walls for the inlet and outlet (7, 8) of gases, said method comprising the steps of:

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- providing an unperforated cylindrical wall (15) coaxial to said gas outlet wall (8) in said catalytic bed (6), said unperforated cylindrical wall (15) extending from an upper end (8a) of said gas outlet wall (8) for a portion of the same of a prefixed length, so as to define a free-space (16) between the gas outlet wall (8) and the unperforated wall (15), for the passage of a part of the gas leaving said catalytic bed (6);

Sub 2
A
- ^{providing} ~~proving~~ means of closing said free-space (16) between the unperforated wall (15) and the gas outlet wall (8), in proximity of the upper end (8a) of the latter, preventing thereby a bypass of said catalytic bed or a recycling to the same of the gas entering respectively leaving the reactor.

2. Method according to claim 1, characterised in that said unperforated wall extends for a portion comprised between 5% and 50% the length of said gas outlet wall (8).

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3. Method according to claim 1, characterised in that said free-space (16) has a thickness comprised between 0,5 and 10 cm.

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4. Method according to claim 1, characterised in that said unperforated wall (15) is supported by said gas outlet wall (8).

Sub 3
5. Method according to claim 4, wherein said gas outlet wall (8) has a diameter smaller than the diameter of said

gas inlet wall (7) and of said unperforated wall (15) respectively, characterised in that said unperforated wall (15) is supported by a gas-tight horizontal baffle (17) which protrudes above the upper end (8a) of said gas outlet wall (8), and leans on the same.

6. Heterogeneous synthesis reactor ~~of the type~~ comprising:

- an external shell (2);

- at least a catalytic bed (6) of the radial or axial-radial type, provided with opposite perforated cylindrical walls for the inlet and outlet (7, 8) of gases, extended in

characterized in that it further comprises in said catalytic bed:

- an unperforated cylindrical wall (15) coaxial to said gas outlet wall (8) in said catalytic bed (6), said unperforated cylindrical wall (15) extending from an upper end (8a) of said gas outlet wall (8) for a portion of the same of a prefixed length, so as to define a free-space (16) between the gas outlet wall (8) and the unperforated wall (15), for the passage of a part of the gas leaving said catalytic bed (6);

- means of closing said free-space (16) between the unperforated wall (15) and the gas outlet wall (8), in proximity of the upper end (8a) of the latter, preventing thereby a bypass of said catalytic bed or a recycling to the same of the gas entering ~~respectively~~ leaving the reactor.

7. Reactor according to claim 6, characterised in that said unperforated wall (15) extends for a length comprised between 5% and 50% the length of said gas outlet wall (8).

8. Reactor according to claim 6, characterised in that said

free-space (16) is substantially annular and has a thickness comprised between 0,5 and 10 cm.

5 9. Reactor according to claim 6, characterised in that said unperforated wall (15) is supported by said gas outlet wall (8).

10 10. Reactor according to claim 9, wherein said gas outlet wall (8) has a diameter smaller than the diameter of said gas inlet wall (7) and of said unperforated wall (15) respectively, characterised in that said unperforated wall (15) is supported by a gas-tight horizontal baffle (17) which protrudes above the upper end (8a) of said gas outlet wall (8), and leans on the same.

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